



Illinois Department of Transportation

Departmental Policies

Policy MAT-11
January 1, 2004

MANUAL FOR MATERIALS INSPECTION

1. POLICY.

The Department shall publish and maintain a Manual which contains guidelines for the inspection of materials used in road and bridge construction.

2. PURPOSE.

The purpose of this Policy is to provide for the publication of a Manual to serve as a guide and source of reference for the procedures to be followed by those involved in the inspection of the road and bridge construction materials.

3. GUIDELINES FOR IMPLEMENTATION.

- A. The Manual is prepared with major emphasis on practices and procedures currently specified in Illinois Department of Transportation Standard Specifications for Road and Bridge construction.
- B. The Manual is intended as an aid in training the inexperienced inspector and to help the more experienced in performing work more efficiently.
- C. The Manual also constitutes a source of basic information essential to the inspection.
- D. The Manual contains sampling and inspection procedures which will promote uniformity throughout the State of Illinois and Department of Transportation.

4. RESPONSIBILITIES.

- A. The Bureau of Materials and Physical Research is responsible for the issuance of this policy.

- B. The Division of Highways' Districts are responsible for ensuring compliance with this Policy.
- C. The Engineer of the Materials Testing Section of the Bureau of Materials and Physical Research, should be contacted when questions arise regarding the application of these procedures.

5. ACCESSIBILITY.

Copies of the *Manual for Materials Inspection* may be obtained from the Bureau of Highways Administration in the Harry R. Hanley Building, 2300 South Dirksen Parkway, Springfield, Illinois, 62764. This policy and the corresponding Manual may be examined in the Hanley Building Library.

Questions regarding the *Manual for Materials Inspection* may be directed to the Bureau of Materials and Physical Research, 126 East Ash Street, Springfield, IL 62704-4766.

CLOSING NOTICE.

Supersedes: Departmental Policy MAT-11, *Manual for Materials Inspection*, November 1, 2000.

Portions of this Policy and Manual supersede the following Policies in their entirety:

Policy MAT-3, *Instructions for the Inspection of Concrete Pipe and Masonry Unit*, formerly Departmental Order 15-9, dated December 6, 1976.

Policy MAT-4, *Instructions for the Inspection of Corrugated Metal Pipe and Guard Rail*, formerly Departmental Order 15-10, dated December 6, 1976.

Approval:



Director of Highways

January 7, 2004

Date

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January 7,2004

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PREFACE

This manual attempts to address the needs of material inspectors in determining how materials or products are to be accepted (or rejected). If acceptance requires sampling, the frequency and size of the samples are detailed where appropriate. The internet version is a condensed version of the previous manual. Information from the expanded version can be found at the following internet link <http://www.dot.il.gov/dobuisns.html>.

The inspector may utilize the Department's Report2Web at the following **intranet** link <http://cocent1report1/r2w25/secure/exploreView.asp?pg=1&B=PESRA&fc=-1&v=45>. This report is designed to aid the inspector in determining which lot, batch, or heat numbers need to be sampled. It is also a good resource in checking the approval status of fasteners, paint, curing compounds, strands etc.

There are many specification source documents that should be familiar to an inspector, such as the Illinois Department of Transportation (IDOT) *Standard Specifications for Road and Bridge Construction*, ASTM, AASHTO, IDOT manuals, and IDOT policy memoranda, to name a few. Many material specifications can be very complex. Knowing the specific details about the acceptance parameters of each material to be inspected is important. Copies of these specifications are usually available at each District Materials office, but can also be found on the internet. The following is a list of links to the internet sites where these specifications can be found:

Standard Specifications	http://www.dot.il.gov/desenv/stdspecs1.html
IDOT Special Provisions	http://www.dot.il.gov/desenv/suppspec.html
BMPR Policy Memorandums	http://www.dot.il.gov/materials/index2.html
BMPR "M" Specs	http://www.dot.il.gov/materials/mspecs/mspecs.html
BDE Special Provisions	http://www.dot.il.gov/desenv/bdespecprov.html
Local Roads Special Provisions	http://www.dot.il.gov/blr/isp.html
Highway Standards	http://www.dot.il.gov/desenv/hwystds/rmdgn.html

For any other specification listed under the Spec Reference in Part 1, please contact the BMPR Contact Person responsible for that particular material.

If an inspector can determine from visual observations, markings, or material certifications that a material does not meet the requirements of a specification, the product should be rejected at the sampling site. By so doing, the supplier can replace the material, or the contractor can find another supplier without the delay of sampling, shipping, testing, and reporting before replacing non-compliant material.

Section 1000 of the IDOT *Standard Specifications for Road and Bridge Construction* is the primary source for determining the appropriate specification for most materials. Inspectors should also become familiar with the following parts of the IDOT Standard Specifications as they are also quite useful:

Section 106., Control of Materials

Section 101., **Source of Supply and Quality Requirements.** The materials used on the work shall meet all quality requirements of the contract. In order to expedite the inspection and testing of materials, the Contractor shall notify the Engineer of the proposed sources of materials prior to delivery. At the option of the Engineer, materials may be approved at the source of supply before delivery is started. If it is found after trial that sources of supply for previously approved materials do not produce uniform and satisfactory products, or if the product from any source proves unacceptable at any time, the Contractor shall furnish acceptable materials from other sources.

All materials to be permanently incorporated in the work shall be new unless otherwise specifically prescribed in the contract documents

All iron and steel products, which are to be incorporated into the work shall be domestically manufactured or produced and fabricated. The Contractor shall obtain from the iron or steel producer and/or fabricator, in addition to the mill analysis, a certification that all iron or steel materials meet these domestic source requirements.

The application of all coatings, epoxy, galvanizing, painting, etc., to metal products shall be domestically applied.....

Section 101., Definition of Terms
Appendix, Metric Information

One very important aspect in determining the correct specification for any given material is Article 105.05 of the IDOT Standard Specifications. It details the “hierarchy” of contract documents. Through this protocol, one specification serves to “overrule” another, i.e., a Contract Special Provision or a Plan Note may reference a **different** ASTM or AASHTO specification than that referenced by the Standard Specifications. Article 105.05 is reproduced here to emphasize the importance of the inspector knowing exactly what specification covers the material or product being inspected.

105.05 Coordination of the Contract Documents. The documents included in the contract are intended to be complementary and to describe a complete work. If the Department determines a conflict exists between the contract documents, the following hierarchy will be applied and the Contractor shall then complete the work according to the interpretation made by the Department.

Hierarchy of the Contract Documents		
Special Provisions	Hold over:	Plans, Recurring Special Provisions, Supplemental Specifications, and Standard Specifications
Plans ^{1/, 2/, 3/}	Hold over:	Recurring Special Provisions, Supplemental Specifications, and Standard Specifications
Recurring Special Provisions	Hold over:	Supplemental Specifications and Standard Specifications
Supplemental Specifications	Hold over:	Standard Specifications

1/ Detail plans hold over Highway Standards.

2/ Calculated dimensions hold over scaled dimensions

3/ The Highway Standards indicated by the revision number listed in the Index of Highway Standards on the plans shall hold over Highway Standards

Inspectors also need to know how to take samples and where to send samples that are taken.

Samples of Material - Sample(s) that will be used for acceptance or rejection of the material shall be taken by an approved representative of the Illinois Department of Transportation, unless otherwise specified. The sample(s) shall be taken in accordance with the methods designated in Part 2 of this guide. Part 2 of the Manual of Materials Inspection can be viewed in its entirety through the use of MISTIC-SAS. IDOT personnel that are not familiar with MISTIC-SAS operations should consult with

their District MISTIC Coordinators for assistance. this guide. The Inspector/Engineer shall be given access to facilities that maybe required by him/her to collect and forward the sample(s). The Contractor shall not use the material(s) represented by the sample(s) until they have been found to meet the appropriate specification requirements. The sample(s) shall be provided for without charge to the Department, unless otherwise described in the specification. All sample(s) shall be of the correct size and sent to the Department in a properly approved marked container(s).

Shipment of Samples - All sample(s), accompanied by properly filled out paper work shall be sent to the ***Illinois Department of Transportation, Bureau of Materials & Physical Research(BMPR), 126 East Ash Street, Springfield, Illinois 62704-4766.*** The samples shall be marked to the attention of a representative of the responsible laboratory.

When the Method of Acceptance is LIST, these Approved Lists can be found on the internet at <http://www.dot.il.gov/materials/materialslist.html>

DEFINITION

Standard Specifications: The term "Standard Specifications" appearing throughout this manual refers to the current edition of the "IDOT Standard Specifications for Road and Bridge Construction" and the latest supplements.

AAN - American Association of Nurserymen
AAR - Association of American Railroads
AASHTO - American Association of State Highway and Transportation Officials
AC - Analytical Chemistry Laboratory
AG - Aggregate Laboratory
AISC - American Institute of Steel Construction
ANSI - American National Standards Institute
ARA - American Railway Association
AREA - American Railway Engineering Association
ASA - American Standards Association
ASLA - American Society of Landscape Architects
ASTM - American Society for Testing and Materials
AWG - American Wire Gauge
AWPA - American Wood Preservers Association
AWWA - American Water Works Association
AWS - American Welding Society
BBS - Bureau of Bridges and Structures
BC - Bituminous Chemistry Laboratory
BDE - Bureau of Design and Environment
BM - Bituminous Mixtures Laboratory
BMPP - Bureau of Materials and Physical Research
BWC - Bridge Welding Code
CM - Cement Laboratory
CN - Concrete Laboratory
CRSI - Concrete Reinforcing Steel Institute
EPA - United States Environmental Protection Agency
FAA - Federal Aviation Administration
FCC - Federal Communications Commission
FHWA - Federal Highway Administration
FSS - Federal Specifications and Standards
GSA - General Services Administration
IEEE - Institute of Electrical and Electronics Engineers
IEMA - Illinois Emergency Management Agency
IEPA - Illinois Environmental Protection Agency
ICEA - Insulated Cable Engineers Association
IDOT - Illinois Department of Transportation
IMSA - International Municipal Signal Association
ISO - Insurance Services Organization
ITE - Institute of Transportation Engineers
MT - Metals Laboratory
MUTCD - Illinois Manual on Uniform Traffic Control Devices
NEC - National Electrical Code
NEMA - National Electrical Manufacturers Association
NESC - National Electrical Safety Code
NFPA - National Fire Protection Association
NRMCA - National Ready-Mix Concrete Association
SAE - Society of Automotive Engineers
SSPC - Steel Structures Painting Council
Std Spec - IDOT Standard Specifications for Road and Bridge Construction
UL - Underwriters Laboratories
USASI - United States of America Standards Institute
USDA - United States Department of Agriculture

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BC - Bituminous Chemistry Laboratory
BDE - Bureau of Design and Environment
BM - Bituminous Mixtures Laboratory
BMPP - Bureau of Materials and Physical Research
BWC - Bridge Welding Code
CM - Cement Laboratory
CN - Concrete Laboratory
CRSI - Concrete Reinforcing Steel Institute
EPA - United States Environmental Protection Agency
FAA - Federal Aviation Administration
FCC - Federal Communications Commission
FHWA - Federal Highway Administration
FSS - Federal Specifications and Standards
GSA - General Services Administration
IEEE - Institute of Electrical and Electronics Engineers
IEMA - Illinois Emergency Management Agency
IEPA - Illinois Environmental Protection Agency
ICEA - Insulated Cable Engineers Association
IDOT - Illinois Department of Transportation
IMSA - International Municipal Signal Association
ISO - Insurance Services Organization
ITE - Institute of Transportation Engineers
MT - Metals Laboratory
MUTCD - Illinois Manual on Uniform Traffic Control Devices
NEC - National Electrical Code
NEMA - National Electrical Manufacturers Association
NESC - National Electrical Safety Code
NFPA - National Fire Protection Association
NRMCA - National Ready-Mix Concrete Association
SAE - Society of Automotive Engineers
SSPC - Steel Structures Painting Council
Std Spec - IDOT Standard Specifications for Road and Bridge Construction
UL - Underwriters Laboratories
USASI - United States of America Standards Institute
USDA - United States Department of Agriculture

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

AGGREGATES – 001 (Responsible Location – AG)

(BMPR Contact Person: Sheila Beshears 217-782-7206)

Acceptance is usually based on quality and gradation at the aggregate source.

- Spec Reference
 - Std Spec Sections 1003, 1004 & 1005
 - Refer to IDOT Aggregate Inspector Handbook for Quality Testing Criteria
 - BMPR Policy Memo “Aggregate Gradation Control System (AGCS)”
- Method of Acceptance – QUAL, TEST

BITUMINOUS MATERIAL – 100 (Responsible Location - BC)

(BMPR Contact Person: Dennis Oehmke 217-782-7217 or Vickie Prill 217-782-1916)

Performance Graded (PG) Asphalt Binders, Road Oils, and Cutback Asphalt

- Spec Reference
 - Std Spec Section 1009.05
 - BMPR Policy Memo “Performance Graded Asphalt Binder Acceptance Procedure”
 - BMPR Policy Memo “Cutback Asphalt and Road Oil Acceptance Procedure”
- Method of Acceptance – QUAL, TEST

Emulsified Asphalt

- Spec Reference
 - Std Spec Sections 1009.07, 1060.08
 - BMPR Policy Memo “Emulsified Asphalt Acceptance Procedure”
 - IDOT Special Provision for Polymer Modified Emulsified Asphalt
 - Local Roads Special Provision for Penetrating Emulsified Asphalt
 - IDOT M Spec (M17-95) Bituminous Mixtures for Maintenance Use Emulsified Asphalt Type
 - BDE Special Provision for Polymer Modified Emulsified Asphalt for Tack Coat
- Method of Acceptance – QUAL, TEST

Note: When samples are obtained from storage tanks or lines with a sampling valve or spigot for the above materials, always draw and discard a minimum of one gallon to clean the line before collecting samples.

Pipe Coating

- Spec Reference
 - Std Spec Section 1006.01
- Method of Acceptance – TEST

BITUMINOUS MIXTURES – 175 (Responsible Location – BM)

(BMPR Contact Person: Jim Trepanier 217-782-9607 or Laura Shanley 217-524-7269)

Acceptance of Bituminous Mixtures is accomplished by testing at the Hot Mix Asphalt plant to verify compliance to mix design.

QC/QA Projects

- Spec Reference
 - Special Provision for QC/QA of Bituminous Mixtures
- Method of Acceptance – QC/QA, TEST, VIS

Non QC/QA Projects

- Spec Reference
 - Std Spec Sections 312, 355, 356, 404, 405, 406, 407, 482
- Method of Acceptance – TEST, VIS

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

CASTINGS (FRAME, GRATES, & LIDS) – 200 (Responsible Location – MT)
(BMPPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Gray Iron & Ductile Iron Castings

Castings are accepted on the basis of manufacturers certification and a visual inspection for condition and contract compliance. Gray iron and ductile iron castings shall conform to of the Standard Specifications and to the respective standards and specifications indicated in Part 2 (Material Codes, Specifications, and Acceptance Methods) herein. Basic inspection procedure for castings is summarized in the following articles.

Note: Domestic Steel Act applies.

Type, Size, and Number

Determine the type, size, and number of castings to be inspected. Usually you can get this information from the contract, plans, and Contractor's order.

Manufacturer's Certificate of Compliance

The inspector shall obtain a manufacturer's certificate of compliance.

Visual Inspection

Look at the casting to see that it is the right type (as compared to the appropriate drawing) and check physical dimensions by measurement to establish that it is the correct size.

Gray Iron Castings

The inspection of gray iron castings is primarily a visual inspection. The inspector should look for the casting to be free from cracks, fused-on sand, runners, risers, and other cast-on pieces. The casting should be relatively smooth. The tensile strength of gray iron is between 207 to 310 MPa (30-45 ksi).

Physical Dimensions - Checking the physical dimensions requires measuring the casting for substantial conformance to the Highway Standard drawing or the specified special drawing.

Weight of Casting - When adequate facilities are available, a random sampling (1 in 50) of the casting may be weighed.

Ductile Iron Castings

The inspection of ductile iron castings should follow the procedure set forth for gray iron castings. Ductile iron has a higher strength and ductility than gray iron. The tensile strength ranges from 414 to 828 MPa (60-120 ksi).

Ductile iron is allowed to be used primarily in the lids and grates.

Physical Dimensions - Follow the procedure for gray iron castings.

Weight of Casting - Follow the procedure for gray iron castings.

- Spec Reference
 - Std Spec Section 1006.14, 1006.15, 1075.01, 1088.07
 - Contract Plans, Special Provision
 - Highway Standards
 - AASHTO M 105, M 306
 - ASTM A 47M, A 536M,
- Method of Acceptance – CERT, VIS

PORTLAND CEMENT CONCRETE – 215 (Responsible Location – CN)
(BMPPR Contact Person: Paul Jenkins 217-557-9349)

- Spec Reference
 - Std Spec Section 1020
 - IDOT Special Provision for “QC/QA of Concrete Mixtures”
 - IDOT Special Provision for “QC/QA of Concrete Mixtures at the Plant – Single A ”
 - IDOT Special Provision for “QC/QA of Concrete Mixtures at the Plant – Double A”
- Method of Acceptance – QC/QA, TEST

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

CONCRETE MASONRY UNITS & MISC PRECAST – 250 (Responsible Location – CN)
(BMPPR Contact Person: Paul Jenkins 217-557-9349)

Note: Domestic Steel Act applies.

- Spec Reference
 - BMPPR Policy Memo “QC/QA Program for Precast Concrete Products”
- Defects and Rejections
 - See Appendix B
- Method of Acceptance - QUAL

Precast Bridge Beams

- Spec Reference
 - Std Spec Section 504.06
 - BMPPR Policy Memo “QC/QA Program for Precast Concrete Products”
- Method of Acceptance – QUAL

PRESTRESSED & POST-TENSIONED PCC BRIDGE BEAMS – 275 (Responsible Location – MT)
(BMPPR Contact Person: Paul Jenkins 217-557-9349)

- Spec Reference
 - Std Spec Section 504.06
 - Manual for Inspectors of Precast Prestressed Concrete Products
- Method of Acceptance – TEST

ELECTRICAL CABLE & CONDUIT – 300 (Responsible Location – MT)
(BMPPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Electrical Cable, Conduit and Fittings

Acceptance is based on visual examination at the jobsite or supplier location by district personnel. Electrical cable should be inspected on reel lots when possible. Conductor size should be measured by micrometer, and the number of conductors in stranded wire counted.

Note: Domestic Steel Act applies.

- Spec Reference
 - Std Spec Sections 1066, 1076.03 ,1079, 1088.01
 - Contract Plans, Special Provision
 - ASTM B 3M, B 8M, B 33M & B 189M
- Method of Acceptance – VIS

Unit Duct

Cable shall be inspected by District personnel.

- Spec Reference
 - Std Spec Section 1088.01, 1066.01
 - Special Provision
 - Labeled with the proper NEMA or NEC markings
- Method of Acceptance – VIS

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

Tether Wire and Span Wire

Tether wire and span wire shall be examined for a diameter and number of strands and for compliance with the Standard Specifications. Samples shall be taken and submitted to BMPR for testing.

- Spec Reference
 - Std Spec Section 1076.03, 1077.04
 - Contract Plans
- Method of Acceptance – TEST

LIGHT & SIGNAL COMPONENTS – 330 (Responsible Location – MT)
(BMPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Inspection Procedures

Above-ground light and signal components are included in this material group. Inspection standards and specification dimensions and tolerances for these components may be found in the Standard Specifications, contract plans, special provisions, and shop drawings. These materials can be measured, counted, and given a visual inspection by the District Materials inspectors, District Traffic personnel, or the District Construction personnel.

Note: Domestic Steel Act applies.

Light & Signal Posts, Poles, and Mast Assemblies

These materials should be inspected for conformance with shop drawings and specifications approved by the District Traffic section and/or District Electrical section. Special attention should be directed to welded and slip fit joints. Should a question arise concerning joints, the Bureau of Bridges & Structures can lend assistance. Galvanized products should be checked for minimum coating thickness with a thickness gauge.

Service Installations

Service installations may be inspected at the site of assembly or on the job site.

- Spec Reference
 - Std Spec Sections 1086
- Method of Acceptance – VIS

LUMBER & TIMBER PRODUCTS - 350 (Responsible Location – MT)
(BMPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

- Spec Reference
 - Std Spec Section 1007, 1069.01, 1077.04, 1086.01
 - BMPR Policy Memo "Inspection Procedures and Approved Inspection Agencies for Timber and Preservative-treated Timber Products"
- Method of Acceptance – CERT, VIS

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

PILING – 365

Timber Piling (Responsible Location – MT)

(BMPPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Untreated timber piling that is in conformance with the specifications shall be branded with the inspector's hammer. Evidence of conformance to the specifications for metal and concrete piling may consist of an "ILL OK" stamp or a green tag.

Note: Domestic Steel Act applies.

- Spec Reference
 - Std Spec Section 1007.08
 - BMPPR Policy Memo "Inspection Procedures and Approved Inspection Agencies for Timber and Preservative-treated Timber Products"
- Method of Acceptance – CERT, VIS

Metal Piling (Responsible Location – MT)

(BMPPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

The majority of steel for piling is taken on manufacturer certification. These materials can be measured, counted, and visually inspected by District Materials, Traffic, or Construction personnel. The primary aspect of inspection of metal shell, sheet, and H-beam piling revolves around visual inspection, determination of workmanship, and physical dimensions. It is the responsibility of the supplier or contractor to furnish a certification of the mill analysis for the proper heat numbers. The visual inspection should include determination of the following:

- Heat numbers which should be painted or stamped on each piece.
- The gauge of the material is to be determined with a micrometer; in the case of metal shell piling, it may be necessary to use a micrometer with the feeler tips milled down to a point.
- General appearance and condition of any welds such as on spirally welded metal shell piling.
- Physical dimensions.
- General surface condition.
- Condition of the channel locks on sheet piling.

The majority of steel for piling is taken on certification. However, when it is necessary to sample for tests, refer to Part 2 (Material Codes, Specifications, and Acceptance Methods) herein for sampling and acceptance procedures.

- Spec Reference
 - Std Spec Sections 512.05, 1006.05
- Method of Acceptance – CERT, VIS

Metal Shoes (Responsible Location – MT)

(BMPPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

When specified, steel H-piles shall be fitted with pile points of the specified design

- Spec Reference
 - Std Spec Section 512.05
 - Contract Plans, Special Provision
 - ASTM A 27M
- Method of Acceptance – CERT, VIS

Precast Concrete Piling (Responsible Location – CN)

(BMPPR Contact Person: Paul Jenkins 217-557-9349)

- Spec Reference
 - Std Spec Sections 504.05, 512.03
 - BMPPR Policy Memo "QC/QA Program for Precast Concrete Products"
- Method of Acceptance – QUAL

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

Precast Prestressed Concrete Piling (Responsible Location – CN)
(BMPR Contact Person: Paul Jenkins 217-557-9349)

- Spec Reference
 - Std Spec Sections 504.05, 512.03
 - Manual for Inspectors of Precast Prestressed Concrete Products.
- Method of Acceptance – QUAL

PORTLAND CEMENT & OTHER CEMENTITIOUS MATERIALS – 375 (Responsible Location – CM)
(BMPR Contact Person: Jerry Hammitt 217-782-4028)

Portland Cement

- Spec Reference
 - Std Spec Section 1001.01
 - BMPR Policy Memo “Portland or Blended Acceptance Procedure for Qualified and Non-Qualified Plants”
- Method of Acceptance – QUAL, TEST

Fly Ash

Finely divided by-product that results from the combustion of ground or powdered coal

- Spec Reference
 - Std Spec Section 1010
 - BMPR Policy Memo “Acceptance Procedure For Finely Divided Minerals Used In Portland Cement Concrete & Other Applications”
- Method of Acceptance – QUAL, TEST

Slag – Ground Granulated Blast Furnace

Ground granulated blast furnace (GGBF) slag is a glassy granular material formed when molten blast furnace slag is rapidly chilled, and then ground to a portland cement fineness

- Spec Reference
 - Std Spec Section 1016
 - BMPR Policy Memo “Acceptance Procedure For Finely Divided Minerals Used In Portland Cement Concrete & Other Applications”
- Method of Acceptance – QUAL, TEST

Microsilica

Microsilica is an amorphous silica of high silica content and purity possessing high pozzolanic activity.

- Spec Reference
 - Std Spec Section 1014
 - BMPR Policy Memo “Acceptance Procedure For Finely Divided Minerals Used In Portland Cement Concrete & Other Applications”
- Method of Acceptance – QUAL, TEST

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

High-Reactivity Metakaolin

High-reactivity metakaolin (HRM) is a reactive aluminosilicate pozzolan formed by calcining purified kaolinite at a specific temperature range.

- Spec Reference
 - Std Spec Section 1015
 - BMPR Policy Memo "Acceptance Procedure For Finely Divided Minerals Used In Portland Cement Concrete & Other Applications"
- Method of Acceptance – QUAL, TEST

WATERPROOFING – 380 (Responsible Location – BC)

(BMPR Contact Person: Dennis Oehmke 217-782-7217 or Vickie Prill 217-782-1916)

Materials are confined to three systems: General Construction, Bridge Deck, and Reflective Crack Control

- Spec Reference
 - Std Spec Sections 1060, 1061, 1062, 1063
- Method of Acceptance – TEST, QUAL (Asphalt Emulsion for Waterproofing).

PAINTS & PAINT MATERIALS – 400 (Responsible Location – AC)

(BMPR Contact Person: Kelly Foxall 217-782-7218 or Vickie Prill 217-782-1916)

Paints and raw materials are typically sampled at the paint manufacturer's plant. As a general guide to sampling these materials, the inspector should refer to ASTM D 3925M "Sampling Liquid Paints and Related Pigmented Coatings" and ASTM D 268M "Sampling and Testing Volatile Solvents and Chemical Intermediates for Use in Paint and Related Coatings and Materials" or sampling techniques developed by BMPR. Paints and raw materials are tested by BMPR. A list of approved lots and batches is maintained by BMPR and is used for acceptance. The batch and lot report can be found on the Report2Web.

Finished Paint

Finished paint can be sampled from either storage tanks prior to filling or during the filling operation. However, if the material has already been packaged, the inspector should then select two containers at random from each batch for sampling. Before drawing a sample, the contents of the container must be thoroughly mixed, making certain that any settled portion is fully dispersed. It is important to seal the sample container immediately with a tight cover to prevent the loss of volatile solvents. The inspection should also ensure that the containers are filled to the correct capacity, properly sealed, and labeled. The label should show the manufacturer, type of material, specification number, batch number, and date of manufacture.

- Spec Reference
 - Std Spec Sections 1008, 1095.02
 - BMPR M Specs
 - Federal Specs
 - ASTM Specs
 - SSPC Specs
 - Special Provisions
- Method of Acceptance – TEST

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

CHEMICALS – 420

Inspection usually involves sampling and submitting to BMPR for testing. However, for materials such as concrete admixtures and asphalt additives, the BMPR maintains a current list of approved products that can be accepted.

Concrete Admixtures (Responsible Location – CN)

(BMPR Contact Person: Melinda Winkelman 217-782-0117 or Doug Dirks 217-782-7208)

Includes air entraining, water reducing, retarding, and accelerating chemicals

- Spec Reference
 - Std Spec Section 1021
- Method of Acceptance – LIST

Asphalt Additives (Responsible Location – BC)

(BMPR Contact Person: Dennis Oehmke 217-782-7217 or Vickie Prill 217-782-1916)

Includes coating and anti-stripping agents

- Spec Reference
 - BMPR IDOT
- Method of Acceptance – LIST

Rejuvenating Agents (Responsible Location – BC)

(BMPR Contact Person: Dennis Oehmke 217-782-7217 or Vickie Prill 217-782-1916)

- Spec Reference
 - IDOT
- Method of Acceptance – LIST

Miscellaneous Chemicals (Responsible Location – AC)

(BMPR Contact Person: Kelly Foxall 217-782-7218 or Vickie Prill 217-782-1916)

Material includes water and protective coat. If the water is acceptable for drinking according to the Department of Public Health, a sample need not be taken.

- Spec Reference
 - Std Spec Sections 1002, 1023
 - AASHTO T 26, AASHTO M 233
 - ASTM D 235M
- Method of Acceptance – TEST

Chemical Adhesives (Responsible Location – MT)

(BMPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Preliminary samples of chemical adhesives are tested by BMPR for approval. These materials shall be tested according to the Standard Specifications. A list of approved adhesives is supplied. Adhesives on the list may be accepted for the use indicated without further sampling. Special attention should be paid to proper mixing

- Spec Reference
 - Std Spec Section 1027
- Method of Acceptance – LIST

Epoxy Resins (Responsible Location – MT)

(BMPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Epoxy resins are accepted on the manufacturer's certificate of compliance to ASTM C 881. The inspector shall verify that the type, grade, and class are being used for the appropriate application.

- Spec Reference
 - Std Spec Section 1025
 - Bridge Special Provisions
- Method of Acceptance – CERT

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

CORRUGATED STEEL PIPE – 450 (Responsible Location – MT)

(BMPPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

The majority of steel for corrugated steel pipe is taken on manufacturer certification. These materials can be measured, counted and visually inspected by District Materials and Construction personnel.

Note: Domestic Steel Act applies.

Inspection Procedures

The base metal for products included in this material group is sheet steel or structural plate which has subsequently been treated with a metallic coating consisting of either a zinc or an aluminum alloy. Precoated and bituminous-coated items have also been listed since, in addition to a metallic coating, the base metal may be further protected and its life cycle extended by the application of either a polymeric or bituminous coating material. The inspection process must therefore include the base metal, its metallic coating, and any additional coating material that may be required. Inspection standards for the production, fabrication, and subsequent acceptance of corrugated steel pipe, structural plate, and related accessories are covered in the applicable sections of the Standard Specifications, AASHTO and ASTM specifications, and the contract plans and/or special provisions.

Acceptance

The inspection can take place at the production site or the job site. Pipe inspected at the production site should be stamped with the inspectors "ILL OK" stamp or accompanied by an LA-15.

Corrugated Steel Pipe

The inspector shall be furnished an itemized list indicating the sizes, lengths, gauges, coating, special treatments when required, and accessories for all products that are requested to be inspected. The products must be easily accessible so that a complete visual and dimensional examination can be made.

The following items are specific areas that the inspector should check during the inspection process and compare with the appropriate references.

Marking

An identification stamp shall be every 0.6 to 1.5 to 2 meters (2-5 ft.) on sheet in coils or cut lengths and on each metal plate. Mixing of brands of the same base metal with the same coating thickness is permitted for galvanized corrugated steel culvert pipe.

Dimensions

Check for compliance with appropriate tolerances described below.

Thickness

Flat sheet material shall be measured at any point not less than 9 mm (3/8 in.) from an edge. Corrugated products are to be measured on the tangents of the corrugations. Assure gauge of metal conforms to the type requirements for pipe size and gauge in the Standard Specifications.

Diameter

Diameter shall be measured on the inside crest of the corrugations. Annular pipe diameters may, as an alternate, be measured in the valley of the outside circumference. This does not apply to helical pipe. Circular pipe and reformed pipe arch tolerances are based on nominal diameters. Tolerances for plate pipe are governed by both the equivalent diameter and corrugation size.

Length

Length is measured as the net length of the finished product. Average length deficiency for pipe shipment shall not exceed 1 percent of lineal meter ordered.

Corrugations

Corrugations shall form smooth, continuous curves and tangents and may be either annular, spiral, or a combination of both. IDOT Standard Specifications denote the corrugation sizes permitted for a specific diameter and type of pipe. The depth, pitch, and spacing of the corrugations should be checked along with the subsequent minimum lap width requirement of the finished product.

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

Rivets

The location, size, and number of rivets for corrugation of the longitudinal seam are based on the sheet thickness, corrugation size, and the diameter of the pipe. Circumferential seam rivets shall be of the same size as for longitudinal seams with a maximum 150-mm (6-in.) spacing, except that only 6 rivets will be required for 300-mm (12-in.) diameter pipe.

Spot Weld

The location, size, and number of spot welds substantially comply with the rivet requirements.

Lock or Welded Seams

For helically corrugated pipe, seams shall be continuous from end to end of each pipe length.

Metallic Coating

The weight of coating is the total amount on both surfaces of the sheet expressed in grams per square meter (g/m^2) (oz./sq. ft). A magnetic type gauge can be used to check the weight of zinc coating. All coating shall adhere to the base metal such that no peeling occurs while the material is being corrugated and formed into the final product. Products having either bruised, scaled, broken, hair-checked, or blistered coating or having "white rust" (zinc oxide) shall be rejected. See Appendix A herein. Bituminous-coated or paved products shall be checked for proper thickness areas.

Workmanship

The completed products shall show careful, finished workmanship in all particulars. Following are some defects that indicate poor workmanship, and the presence of any or all of them in any individual item or generally in any shipment shall be sufficient cause for rejection.

- variation from a straight center line,
- elliptical shape in pipe intended to be round,
- dents or bends in the metal,
- metallic coating which has been bruised, broken, or otherwise damaged,
- lack of rigidity,
- illegible markings on the steel sheet
- ragged or diagonally sheared edges
- uneven laps in riveted or spot-welded pipe
- loose, unevenly lined, or unevenly spaced rivets
- defective spot welds or continuous welds
- loosely formed lock seams

Miscellaneous

Coupling Bands

Coupling bands shall be of the same metallic material as the pipes being connected. Specifications require that the bands shall provide sufficient strength to preserve alignment and prevent pipe separation or soil infiltration. The band may be 3 sheet thicknesses lighter than that used to fabricate the pipe but not less than 1.32 mm (0.052 in.) thick. The widths and configurations for bands will vary for different diameters of pipes and for different styles or depths of corrugations. Neither bituminous coating nor precoating will be required for connecting bands except when used in conjunction with either precoated fully lined pipe or arches; the bands shall then be precoated and be of the hugger or annular type.

Perforations

Perforations shall be approximately circular and clean cut, have a nominal diameter in accordance with the Standard Specifications, and be arranged in rows parallel to the axis of the pipe. Perforations shall be located on the inside crest or along the neutral axis of the corrugations. The rows of perforations and their locations are based on the diameter of the pipe as specified by the current AASHTO specification.

End Finish

A reinforced end finish is not required on inlets nor outlets of corrugated steel pipe; however, when specified, it shall be finished in a satisfactory manner. Cut ends on helically corrugated pipe must be painted with zinc-rich paint.

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

Specialty Items

Special pipe, perforated casings for stone wells, flumes, and pipe requiring a diameter not covered in the specifications shall meet the requirements of the plans or special provisions. The plans or special provisions governing these special items should be furnished to the fabricator in order that the product can be properly constructed and subsequently inspected. Tees, angles, elbows, etc., should be fabricated by welding not by riveting. An approved coating shall be applied after welding. Pipe having a diameter not covered in the specifications shall be of the same gauge and have the same lap as pipe of the nearest diameter in the specifications. If the diameter should be the same number of inches between diameters given in the specifications, the pipe should be fabricated in accordance with the larger diameter.

Handling

The field inspection made by the Engineer shall include an examination of detrimental defects of broken, peeled, and otherwise damaged coating caused by carelessness in handling. Proper care shall be exercised in loading, transporting, unloading, and delivering the finished product to the construction site and in its placement. When nesting or loading, boards or other suitable material running the full length of the product shall be used to prevent metal from rubbing or resting against metal and to prevent damage to the pipe. Special care shall be exercised in preventing rivets or bolts from scratching the adjacent product. Chains or metal cables used in binding the load and unloading shall be encased to prevent damage, or suitable material shall be fastened securely between the product and chains or cable. Wood skids or other approved devices shall be used in loading and unloading. Metal lever bars will not be permitted in loading and unloading. Dragging the product across rocky ground or dragging in such manner as to cause gouging or removal of the coating will not be permitted.

- Spec Reference
 - Std Specs Sections 541, 542, 550, 601, 1006
 - AASHTO M 36, M 167, M 190, M 218, M 245, M 246 & M 274
- Method of Acceptance – CERT, VIS

CONCRETE PIPE & DRAIN TILE – 475 (Responsible Location – CN)
(BMPR Contact Person: Paul Jenkins 217-557-9349)

Note: Domestic Steel Act applies.

- Spec Reference
 - Std Spec Section 1040.06
 - AASHTO M 86, M 170, M 178, M 206, M 207
 - ASTM C 4M
 - BMPR Policy Memo “QC/QA Program for Precast Concrete Products”
- Defects and Rejection
 - See Appendix B
- Method of Acceptance – QUAL

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

PLASTIC PRODUCTS AND GEOTEXTILES – 490 (Responsible Location – MT)

Plastic Pipe

(BMPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Plastic products covered in this material group encompass a wide variety of materials made of natural or synthetic organic compounds. These compounds are united through a process called "polymerization". The material can subsequently be molded, extruded, or cast into various shapes and forms, or drawn into filaments for use as a textile fiber. Plastic pipe can be made from polyvinyl chloride (PVC) and from polyethylene (PE) according to various AASHTO or ASTM specifications. Acceptance for all PE and PVC pipe products requires samples to be tested by BMPR for strength and deflection. Samples are usually taken by district personnel at the producer, supplier, or job site. These samples should be tested in the same construction season in which the products are installed. Many of these products also have specifications for cell classification. The cell classification, along with manufacturer's name or trademark, size, and ASTM or AASHTO designation, is required to be on all PVC pipe. The uses for these products include pipe drains, pipe underdrains, pipe culverts, storm sewer, backslope drains, culvert liners, and water main. Care should be taken to assure that the proper product is used for the specific application.

- Spec Reference
 - Std Spec Section 1040
 - Various AASHTO, ASTM & ANSI/AWWA Specifications
 - Std Spec for Water & Sewer Main Construction in Illinois
 - Contract Plans & Special Provisions
 - Pipe Size, Markings (AASHTO/ASTM) & Cell Classification required on material
 - BDE Manual Article 40.3.07
- Method of Acceptance – TEST

Geotextile Fabrics

(BMPR Contact Person: Riyadh Wahab 217-782-7207 or Paul Guthrie 217-782-9340)

Includes woven or non-woven fabrics made from polypropylene or polyethylene. The inspector should know the intended use of the fabric material that is being inspected. Inspection consists of verification that the unit weight and performance data meets contract requirements. If unit weight cannot be verified, the material shall be sampled as directed in Part 2 herein.

- Spec Reference
 - Std Spec Section 1080.02
- Method of Acceptance – TEST, VIS

Manhole Steps

(BMPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

The manufacturer shall certify that the plastic manhole step meets specification.

- Spec Reference
 - AASHTO M 199
 - ASTM C 478M
- Method of Acceptance – CERT

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

CLAY PIPE & DRAIN TILE – 500 (Responsible Location – MT)

(BMPPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

The inspection procedures for clay pipe consist of laboratory tests and visual inspection of the finished products. Visual Inspection for pipe shall be checked for the following: out-of-round, size & dimensions, straightness, blisters, fractures & cracks, lack of glaze, markings.

Visual Inspection for Drain Tile shall be checked for the following: Cracks, Checks, Chips, Shape, Presence of foreign minerals and chemicals. Drain tile in dry condition should give a clear ring when tapped lightly with a hammer.

- Spec Reference
 - Std Spec Section 1040.01, 1040.02
 - AASHTO M 65
 - ASTM C 4M, C 700M
- Method of Acceptance – TEST, VIS

CAST IRON PIPE – 510 (Responsible Location – MT)

(BMPPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Acceptance is based on manufacturer certification and visual inspection for condition and contract compliance.

Note: Domestic Steel Act applies.

- Spec Reference
 - Std Spec Section 1006.19, 1006.20
 - Contract Plans & Special Provisions
 - Federal Specs WW-P-421, WW-P-401
 - Std Spec for Water & Sewer Main Construction in Illinois
 - ANSI A 21
 - ASTM A 74M
- Method of Acceptance – CERT, VIS

CORRUGATED ALUMINUM PIPE – 520 (Responsible Location – MT)

(BMPPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

The majority of steel for corrugated steel pipe is taken on manufacturer certification. These materials can be measured, counted and visually inspected by District Materials and Construction personnel.

Note: Domestic Steel Act applies.

Inspection Procedures

The base metal for products included in this material group is sheet aluminum or structural aluminum plate. Several photographs are included in Appendix A in Part 3 herein which illustrate defective fabrication results that may also apply to aluminum pipe products.

Corrugated Aluminum Pipe

The inspector shall be furnished an itemized listing indicating the sizes, length, gauges, special treatments when required, and accessories for all products that are requested to be inspected. The products must be easily accessible so that a complete visual and dimensional examination can be made. Each approved product shall be stamped on the inside and outside of one end with an "ILL OK" stamp. A LA-15 may be issued for shipping with the bill of lading. The following items are specific areas that the inspector should check during the inspection process and compare with the appropriate references.

Markings

An identification stamp shall be every 0.6 to 1.5 m (2-5 ft) on coiled sheet used in spiral corrugated pipe and on each sheet or plate used for annular pipe or structural plate products.

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

Dimensions

Thickness

Flat sheet material shall be measured at any point not less than 10 mm (3/8") from an edge. Corrugated products are to be measured on the tangents of the corrugations. Assure gauge of metal conforms to the Standard Specifications type requirement for pipe size and use.

Diameter

Diameter is measured on the inside crest of the corrugations. Circular pipe and reformed pipe arch tolerances are based on nominal diameters. Tolerances for plate pipe arches are governed by both the equivalent diameter and the corrugation size.

Length

Length is measured as the net length of the finished product. The average length deficiency for pipe shipment shall not exceed one percent of lineal feet ordered.

Corrugations

Corrugations shall form smooth, continuous curves; tangents may be either annular, spiral, or a combination of both. The Standard Specifications denote the corrugation sizes permitted for a specific diameter and type of pipe. The depth, pitch, and spacing of the corrugations should be checked along with the subsequent minimum lap width requirement of the finished product.

Rivets

The location, size, and number of rivets per corrugation of the longitudinal seam are based on the sheet thickness, corrugation size, and the diameter of the pipe. Circumferential seam rivets shall be of the same size as for longitudinal seams with a maximum 150-mm (6-in.) spacing except that only six rivets will be required for 300-mm (12-in.) pipe.

Lock Seams

For helically corrugated pipe, the lock seam shall be continuous from end to end of each pipe length, and lapped surfaces shall be in tight contact.

Workmanship

The completed products shall show careful finished workmanship in all particulars. Material Group 450, herein, lists several defects which indicate poor workmanship. These defects, except for spot welding or continuous seam welding which are not permitted for aluminum pipe, also apply in the fabrication of aluminum products. The presence of any or all of these defects in any individual item or, in general, in any shipment shall be sufficient cause for rejection.

Miscellaneous

Coupling Bands

Specifications require that the bands shall provide sufficient strength to preserve alignment and to prevent pipe separation or soil infiltration. Bands shall be aluminum, but either aluminum- or zinc-coated steel may be used for the fasteners of the connecting bands. The band may be three sheet thicknesses lighter than the pipe being connected but not less than 1.2 mm (0.048 in.). The widths and configurations for bands will vary depending on the diameter of pipe and the style or depth of corrugations. Bituminous coating for connecting bands is not required.

Structural Plate Bolts

Plates of longitudinal and circumferential seams shall be staggered so that not more than three plates come together at one point. The bolt and nut assembly fasteners for aluminum plates may be zinc-coated steel, aluminum-coated steel, or aluminum.

Perforations

Perforations shall be approximately circular and clean-cut, have a nominal diameter in accordance with the Standard Specifications, and be arranged in rows parallel to the axis of the pipe. Perforations shall be located on the inside crest or along the neutral axis of the corrugations. The rows of perforations and their locations are based on the diameter of the pipe as indicated in AASHTO M 196M.

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

End Finish

A reinforced end finish is not required on inlets nor outlets of corrugated aluminum pipe; however, when specified, it shall be finished in a satisfactory manner.

Specialty Items

Special pipe or aluminum products not covered by specifications shall meet the requirements of the contract plans and/or special provisions. Data governing these specialty items should be furnished to the fabricator so that the product can be properly constructed and subsequently inspected.

Handling

The field inspection made by the Engineer shall assure that damage has not occurred through carelessness in the loading, transporting, unloading, and delivering the finished product to the construction site and in its final installation. Appropriate methods of handling pipe products are described in Material Group 450 (Part 1) herein.

- Spec Reference
 - Std Spec Sections 1006
 - Contract Plans
 - Special Provisions
 - AASHTO M 196, M 197 & M 219
- Method of Acceptance – CERT, VIS

BRIDGE RAIL - 540 (Responsible Location – MT)

(BMPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

When the physical properties of the material are approved, a visual inspection is required at either the source or the job site. The inspector should take special note that the surfaces of the rail elements and posts have a uniform finish and are not tarnished, have no mottled areas or a gritty appearance. Dip marks or brush marks may not be cause for rejection. All galvanized rail, posts, and accessories should be checked for minimum coating thickness with a magnetic thickness gauge.

Note: Domestic Steel Act applies.

Railing

Aluminum: There are two types of aluminum railing: elliptical pipe (single rail and Type L) and aluminum circular top railing (Type L).

Galvanized Steel for Railings: Acceptance of galvanized steel for railings requires manufacturer's certification of each steel used in fabrication. The certification of the tubular steel shall include the results of Charpy V-notch (CVN) impact testing or drop-weight tear tests. Acceptance also requires a visual inspection of all galvanized pieces for the following: warp or bulge, shipping damage, uniform finish, "white rust" and thickness of the zinc coating. Items showing the appearance of "white rust" may be accepted if: the "white rust" (zinc oxide) is removed or neutralized, the coating thickness is not damaged, **and** the appearance of the item is satisfactory to the Engineer.

Post Railing

Cast Aluminum: Cast aluminum post railing (single rail and Type L).

Malleable Cast Iron: Malleable cast iron post railing (Type M).

Galvanized Steel I-Beam: - Galvanized steel I-beam post railing (Types N, S, and T).

- Spec Reference
 - Std Spec Section 1006.30, 1006.34
 - AASHTO M 111, T 266 (CVN) & M 193
 - ASTM A 47M, B 211M, A 441-79M, A 500M (Drop Weight Tear)
- Method of Acceptance – CERT, VIS

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

GUARD RAIL - MATERIAL GROUP 550 (Responsible Location – MT)

(BMPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Includes guardrail and barrier terminals, post, bolts, hardware, and accessories. The field inspector must check the zinc coating by means of a magnetic thickness gauge. BMPR Policy Memorandum 02-03 "Brand Registration and Guarantee for Corrugated Sheet Steel Beams for Highway Guard Rail" has been replaced by the approved list titled "Approved Producers List Of Corrugated Sheet Steel Beams For Highway Guard Rail". Contact BMPR if material does not comply as outlined below:

Note: Domestic Steel Act applies.

Heat Number - Verify the heat numbers on the railing and posts with the heat numbers shown on the mill analysis.

Physical Dimensions - Determine the physical dimensions of the railing and posts on random pieces including checking the gauge thickness with a micrometer.

Weight of Galvanizing - Randomly check for the weight of the zinc coating with a magnetic-type gauge, such as a Tinsley or Mikro test gauge.

Identification Markings - Verify the following identification markings are present on each piece of rail: manufacturer's name, heat number, AASHTO or ASTM specification, class of rail, and type of zinc coating.

Condition of Galvanizing - If evidence of "white rust" (zinc oxide) is present, and visible pitting of the zinc coating has not occurred, the rail may be cleaned and accepted. If visible pitting of the coating has occurred, the material is unacceptable.

Fasteners - Sample and submit specimens of bolts, nuts, and washers to BMPR for testing; or secure certified laboratory test data for dimensions, tensile strength, proof load, hardness, and weight of the zinc coating; or obtain certification of fasteners from the manufacturer.

Workmanship - Check general workmanship for defects as described below:

Blisters - caused by surface defects in steel or absorbed hydrogen

Flux spots - stale flux burnt on during dipping or flux picked up from top of bath

Inclusions - can be from ash burnt on during dipping, surface residues on steel, flux picked up from top of bath

Dross - a scum formed on the surface of molten metal

Flaking zinc coating or adherence capability - occurs during transportation, erection, and service.

Hair checking or bare spots - caused when steel has not been sufficiently cleaned before galvanizing.

Failure to meet the requirements of the plans and specifications for physical dimensions or galvanized coating, the absence of the necessary mill analysis, or the presence of "white rust" pits, or any workmanship defect shall be cause for rejection.

- Spec Reference
 - Std Spec Section 1006, 1007.09, 1007.12
 - AASHTO M 180, M 232, M 298
 - ASTM A 123M, A 307M
- Method of Acceptance – LIST, VIS

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

LANDSCAPE – 560 (Responsible Location – MT)

(BMPPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Fertilizer

The inspector should ascertain that the manufacturer's guaranteed analysis is stamped on the bag and that it is in conformance with the required analysis. In the case of bulk shipments, the producer must certify in writing as to the analysis, and the inspector in turn verifies it is in compliance with the project requirements.

- Spec Reference
 - Std Spec Sections 250, 1081.08
- Method of Acceptance – CERT, VIS

Seed

Acceptance of seeds under this specification will be based on receipt and approval of a certification covering tests from each lot of seed. The certification must be signed by a registered seed technologist. Lots older than 12 months shall be recertified. Seeds may be sampled at destination on a random basis for comparison with the certification and for compliance to the specifications.

- Spec Reference
 - Std Spec Sections 250, 1080.04
- Method of Acceptance – CERT, TEST

Sod

Sod inspection may be made by the district landscape architect. Sources of sod are subject to inspection by the IDOT. Each shipment is to be accompanied by an inspection certificate.

- Spec Reference
 - Std Spec Sections 250, 1081.03
- Method of Acceptance – CERT, VIS

Plants, Trees, and Shrubs

Trees and shrubs are to be checked for height and/or diameter in accordance with the project provisions. In addition, the spread of the root system for bare-root plants should be checked just as the size of the ball should be checked on balled and burlapped plants.

- Spec Reference
 - Std Spec Section 1081.01, 1081.02
 - American Association Of Nurserymen
 - Agricultural Research Service Publication No. 814
- Method of Acceptance – VIS, CERT

Peat Moss

At the time of sampling, the inspector should ascertain that the peat moss is packed in bales and that each bale is marked with the following information: type of peat moss, brand name, country of origin, cubic feet compressed size, compression ratio used, and approximate bale weight. In the absence of such marking, each shipment must be accompanied by a certificate stating the above information.

- Spec Reference
 - Std Spec Section 1081.09
- Method of Acceptance – TEST, VIS, CERT

Erosion Control

Inspection of erosion control items, such as excelsior blanket, knitted straw mat, staples, stakes, and fiber mat, consists of visual examination of the products for condition and verification from the label or certification that they meet specifications. If compliance cannot be verified, the material shall be sampled as indicated in Part 2 herein.

- Spec Reference
 - Std Spec Section 1081.10
- Method of Acceptance – TEST, CERT, VIS

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

Top Soil

Top soil is to be sampled and tested for compliance.

- Spec Reference
 - Std Spec Section 1081.05
- Method of Acceptance – TEST, VIS

Mulch Materials

Mulch materials for seeding and those of planting shall be in compliance with the Standard Specs.

- Spec Reference
 - Std Spec Section 1081.06, 1081.06
- Method of Acceptance – VIS

FENCING – 575 (Responsible Location – MT)

(BMPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

The inspector should verify class and coating from manufacturer's tag or label. If the label is not available, a sample should be taken as indicated in Part 2 herein.

Note: Domestic Steel Act applies.

Chain Link

The fabric, metal posts and braces, gates, tension wire, fabric ties, bolts and nuts, and fittings shall meet the Standard Specifications and Contract Plans.

- Spec Reference
 - Std Spec Section 1006.27, 1007.11, 1007.12
 - Contract Plans
 - AASHTO M 181, M232
 - ASTM A 500M, A 501M, F 1345M, F 1043M
- Method of Acceptance – TEST, VIS, CERT

Woven Wire Fence

The woven wire, barbed wire, metal posts and braces, gate frames, post tops, and miscellaneous materials shall meet the Standard Specifications and Contract Plans.

- Spec Reference
 - Std Spec Section 1006.28, 1007.11, 1007.12
 - Contract Plans
 - AASHTO M 181, M 232, M 279
 - ASTM A 116M, A 500M, A 501M, A 584M
- Method of Acceptance – TEST, VIS, CERT

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

SIGNING – 600 (Responsible Location – AC)

(BMPPR Contact Person: Kelly Foxall 217-782-7218 or Vickie Prill 217-782-1916)

There are numerous products in the category of signing materials. Tests may be performed by the producer and witnessed by the inspector. In the case of overhead sign trusses, component materials are sampled for testing, but the BBS performs the fabrication inspection.

Note: Domestic Steel Act applies.

- Spec Reference
 - Std Spec Sections 1006, 10074, 1084, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097
 - BMPPR "M" Specifications
 - IDOT "T" Specs (Contact John Nunes at 217-782-8606)
 - IDOT Special Provisions
 - BBS 59
- Methods of Acceptance – CERT, TEST, VIS

JOINT FILLERS & SEALERS & EXPANSION DEVICES – 615

Preformed Joint Fillers and Sealers (Responsible Location – BC)

(BMPPR Contact Person: Dennis Oehmke 217-782-7217 or Vickie Prill 217-782-1916)

These materials cover a wide range of asphalt, cork, plastic, or foam products that are used as preformed joint fillers or sealers.

- Spec Reference
 - Std Spec Section 1051
- Method of Acceptance – TEST

Nonpreformed Joint Fillers and Sealers (Responsible Location – BC)

(BMPPR Contact Person: Dennis Oehmke 217-782-7217 or Vickie Prill 217-782-1916)

These materials include the bituminous-based crack fillers, poured joint fillers, and trowelable mastics.

- Spec Reference
 - Std Spec Sections 1050, 1055
- Method of Acceptance – TEST

Pavement Asphalt Fillers (PAF's) (Responsible Location – BC)

(BMPPR Contact Person: Dennis Oehmke 217 782-7217 or Vickie Prill 217-782-1916)

- Spec Reference
 - Std Spec Section 1009
- Method of Acceptance – TEST

Expansion Joints (Neoprene & EPDM) and Neoprene Joint Sealers (Responsible Location - MT)

(BMPPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Neoprene expansion joints and joint sealers are accepted on the basis of "lot" samples submitted by the manufacturer or fabricator to BMPPR. The approved lot numbers are available in the MISTIC system and listed on the Report2Web or by contacting BMPPR.

- Spec Reference
 - Std Spec Sections 1052, 1053
- Method of Acceptance – TEST

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

REINFORCING STEEL – 625 (Responsible Location – MT)

(BMPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Reinforcement bars, reinforcement bar couplers, dowel bars, and welded wire mesh are accepted only from producers whose production has been certified. Each IDOT highway district is required to take random samples from each producer furnishing bar for use in construction in their district.

Note: Domestic Steel Act applies.

Reinforcement Bars

- Spec Reference
 - Std Spec Section 1006
 - BMPR Policy Memo "Reinforcement Bar and/or Dowel Bar Plant Certification Procedure"
 - AASHTO M 31, M 32, M 42, M 53
- Method of Acceptance – LIST, MARK, TEST

Epoxy-coated Reinforcement Bars

The requirements for accepting epoxy coated steel are the same as described for black bar, plus the following: Epoxy-coated reinforcement bars and pavement dowel bars must be coated by producers that are in good standing in the CRSI Epoxy Coating Certification Program. The inspector should be familiar with the CRSI program. A 3-ring bound manual and informational CD are available from CRSI. BMPR can also provide a copy of the model QC program, upon request. Acceptance of the coating is based on participation in the CRSI program, visual inspection, random field tests, and random BMPR tests.

- Spec Reference
 - Std Spec Section 1006.10
 - BMPR Policy Memo "Reinforcement Fabric Plant Certification Procedure" and "Inspection of Epoxy-coated Reinforcing Bars"
 - AAHSTO M 284M
 - CRSI Certification Program (Coating Plants)
- Method of Acceptance – LIST, MARK, TEST

Bar Splicer/Couplers

- Spec Reference
 - Bridge Manual Base Sheet BSD-1
- Method of Acceptance – LIST, TEST

Pavement Reinforcement and Wire Fabric

- Spec Reference
 - Std Spec Section 1006.10
 - BMPR Policy Memo "Reinforcement Fabric Plant Certification Procedure"
 - AASHTO M 54, M 55
- Method of Acceptance – LIST, MARK, TEST

Joint Assemblies

- Spec Reference
 - Std Spec Section 1006.11
 - BMPR Policy Memo "Reinforcement Bar and/or Dowel Bar Plant Certification Procedure"
 - AASHTO M 227, M 254
- Method of Acceptance – CERT, VIS

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

STRUCTURAL STEEL AND FASTENERS– 650 (Responsible Location – MT)
(BMPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Note: Domestic Steel Act applies.

Structural Steel

Most structural steel is furnished by fabrication companies which fabricate steel plates and shapes into members used in structures.

Fabrication Inspection - Fabrication of structural steel is the responsibility of representatives of the BBS.

Documentation - The mill will provide the inspector with copies of their chemical and physical tests. Upon satisfactory completion of the fabrication, the inspector issues a BBS59, "Structural Steel Fabrication Report." Copies are sent to the Resident Engineer and the District Materials office.

Fasteners

Fasteners are usually sampled by manufacturing lots with specimens submitted to BMPR for testing for compliance with the appropriate specifications. The point of sampling may be at the producer, supplier, fabricator, or job site. In most instances, three samples of each size and manufacturer are required.

Inspection - In general, the inspection process for fasteners is as follows.

Sample Selection - Samples are taken at one of the following:

Manufacturer or Supplier, fabricator, or job site if no evidence of prior inspection. The inspector goes to the appropriate source and selects three pieces of each lot, diameter, length, and manufacturer.

Verification of Markings - The manufacturer's markings must be identified before samples are submitted for testing. This can be accomplished by checking illustrations provided in the "Guide for Identification of Fasteners" herein. If a fastener cannot be identified, BMPR should be contacted.

Shipment of Samples – The samples, after identification and proper packaging, are sent to BMPR for testing.

- Spec Reference
 - Std Spec Section 1006.04
 - BBS59
- Method of Acceptance – TEST, CERT, VIS

MISCELLANEOUS STEEL – 675 (Responsible Location – MT)
(BMPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Note: Domestic Steel Act applies.

Fasteners

The inspection process for miscellaneous steel may require samples. Mill certification furnished by the producer or supplier is required for most items. The material frequently is inspected at the source before shipment to a project.

- Spec Reference
 - Std Spec Section 1006
 - Special Provision
 - Contract Plans
- Method of Acceptance – TEST, VIS

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

Miscellaneous or Special Items

- Spec Reference
 - Std Spec Section 1006
 - Special Provision
 - Contract Plans
- Method of Acceptance – TEST, CERT

MISCELLANEOUS MATERIALS – 700

Bridge Bearing Pads and Related Items (Responsible Location – MT)

(BMPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Includes Elastomeric Bearing Pad, Type I, Types II and III, Pot Bearing, Neoprene & Natural, Rubber Sheets, Teflon (TFE), Stainless Steel Sheets, Neoprene & Fabric Bearing Pads.

Note: Domestic Steel Act applies.

Curing Blankets

Curing blankets include those products manufactured from burlap, burlap and polyethylene, waterproof paper or polyethylene.

Bridge Bearing Pads and Related Items

Elastomeric bearing pads and pot bearings are accepted by letter of approval from BMPR.

Elastomeric Bearing Pad, Type I - If a pad is to be sampled for testing, BMPR will notify the pad manufacturer and the involved district. One extra pad may then be sent to the job site or supplier. The inspector shall pick one pad at random for testing.

Elastomeric Bearing Pad, Types II and III - The sampling procedure is the same as for the Type I bearing; however, the manufacturer will also supply samples of rubber, teflon, and stainless steel from the same lots as used in the bearing to BMPR. The top steel plate and the bottom steel plate on the Type II and Type III bearings shall be attached to the rubber during the vulcanizing process. A bonding epoxy is not permitted to attach the steel plates. The inspector shall visually check tests pads for evidence of extrusions of epoxy.

Pot Bearing - The sampling procedure for the pot bearing is the same as for the Type I bearing; however, the manufacturer will also supply samples of rubber and Teflon from the same lots as used in the bearing to BMPR.

Neoprene and Natural Rubber Sheets - These are components of the Types I, II, and III elastomeric pads and the pot bearing. A minimum of 152 mm x 152 mm (6" x 6") sample from the same lot of the bearing is required.

Teflon (TFE) - The Teflon sheet shall consist of pure TFE resin.

Stainless Steel Sheets

Neoprene Bearing Pads

Fabric Bearing Pads - Fabric bearing pads shall consist of a fabric and rubber body made with new unvulcanized rubber and unused fabric fibers.

- Spec Reference
 - Std Spec Sections 1082 & 1083
 - AASHTO *Standard Specifications for Highway Bridges*, Section 25, Table B.
- Method of Acceptance – TEST, CERT

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

Brick (Clay or Shale) (Responsible Location – MT)

(BMPPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Includes sewer and building brick.

Facing - Facing brick made from clay, shale, fire clay, or mixtures thereof and fired to incipient fusion are specified in ASTM C 216M. The inspector should refer to this specification as visual inspection is critical for color, cracks, chips, size, and warpage.

Sewer and Building - Sewer brick made from clay or shale and burned and intended for use in (1) drainage structures for the conveyance of sewage, industrial wastes, and storm water, and (2) structures such as manholes and catch basins are specified in ASTM C 32M. Building brick made from clay and shale and burned and intended for use in brick masonry are specified in Section 1041 of the Standard Specifications and in AASHTO M 114M. The bricks shall conform by visual inspection to the requirements in the plans and to the samples passing physical requirements. Minor indentations and surface cracks incidental to manufacturing, or small chipping resulting from handling, should not be cause for rejection.

- Spec Reference
 - Std Spec Section 1041.01
 - AAHSTO M 114
 - ASTM C 216M, C 32M
- Method of Acceptance – TEST

Pavement Tape and Markings (Responsible Location – AC)

(BMPPR Contact Person: Kelly Foxall 217-782-7218 or Vickie Prill 217-782-1916)

Includes pavement marking tape (permanent and temporary), preformed plastic pavement marking, and thermoplastic pavement markings

- Spec Reference
 - Std Spec Section 1095.01
- Method of Acceptance – CERT, TEST

MISCELLANEOUS METAL MATERIALS – 775 (Responsible Location – MT)

Because of the wide range of materials in this material group, it is important to have specific information regarding the description of the item. The material group listing in Part 2 herein will give some information. In addition, for many items it may be necessary to have access to a copy of one or more of the following: Contract plans, Special provisions, Specifications from various IDOT bureaus, Highway standards, ASTM and AASHTO standards.

Note: Domestic Steel Act applies.

Nonferrous Tubing, Fittings, and Plates

(BMPPR Contact Person: Ed Hughes 217-782-4689 or Ray Rowden 217-782-4666)

Includes copper water tube, red brass pipe, brass valve corporation stops, bronze bearing plates, bronze castings, lead plates, and name plate.

Copper Water Tube - Seamless copper water tube is suitable for general plumbing and similar applications for the conveyance of fluids. The tube may be furnished in either coiled or straight lengths. The requirements for this material are covered in ASTM B 88M, Type K. Acceptance of copper water tubing is by visual inspection for condition and to verify Type K and the manufacturer. The type and manufacturer are stamped into the pipe at 300-mm (1-ft) intervals.

Red Brass Pipe - This material is a seamless pipe that is produced in accordance with ASTM B 43M in all standard pipe sizes. It is rigid in form and is supplied in lengths, not coils. The wall thickness is approximately twice that of copper water tube.

Brass Valve Corporation Stops

MATERIAL GROUPS & ACCEPTANCE REQUIREMENTS

Bronze Bearing Plates - These bronze plates are used in contact with hardened steel plates for bridge expansion bearings.

Bronze Castings - The bronze casting shall conform to the requirements given in the contract plans or special provisions.

Lead Plates - These lead plates, which are used primarily between the bottom steel bearing plate and top of the concrete bridge pier and abutments, compensate for the unevenness of the concrete.

Name Plates - Examples of possible cause for rejection are as follows: poorly formed letters, lettering correctness (alignment, spacing and height), overall dimensions, and length of lugs (if present).

- Spec Reference
 - Std Spec Section 1006
 - IDOT Highway Standard
- Method of Acceptance – VIS

Markers

Includes Survey Markers, Monument markers, Section markers, Brass covers. A survey marker is a mushroom-shaped object approximately 83 mm (3 1/4 in.) in diameter on top with approximately a 75-mm (3 in.) tapered stem. Survey Markers - A survey marker is a mushroom-shaped object approximately 83 mm (3 1/4 in.) in diameter on top with approximately a 75-mm (3-in.) tapered stem.

- Spec Reference
 - Std Spec Section 1006
 - IDOT Highway Standard
- Method of Acceptance – VIS

MISCELLANEOUS MAINTENANCE MATERIALS – 800

The majority of items in this material group are covered in BMPR "M" Specifications.

Note: Domestic Steel Act applies.

Part 3 Appendices

APPENDIX A

Illinois Department of Transportation

PHOTOGRAPHS of CORRUGATED METAL PIPE

Defects and rejections can be found at the following Internet link:

<http://www.dot.il.gov/materials/corrugatedmetalpipe.pdf>

Part 3 Appendices

APPENDIX B

Illinois Department of Transportation

PATCHING PROCEDURE FOR PRECAST PRODUCTS

Minor chips or broken ends may be patched with the following provisions, after Engineer approval.

1. The area to be patched has all loose material removed, and the area cut back until coarse aggregate will break under chipping rather than fall out. The sides of the area to be patched shall be shaped with one or more faces having a minimum depth of 12.7 mm as perpendicular as possible to the surface of the area. The patch shall be cured according to the specifications. If a patch mix or grout is used, the patch shall be cured according to the manufacturer's recommendations. Aggregates may be used in the patch mix as recommended by the manufacturer.
2. A neat cement slurry or an approved bonding agent is first applied to the area to be patched. The patch material shall be a no-slump concrete mix that can be packed solidly into the defective area, or an approved commercial patch mix or grout applied as recommended by the manufacturer. The bonding agent shall be applied with a stiff brush to a dry surface.

For current information, contact the BMPR or the local District Bureau of Materials.

Photographs of defects and rejections can be found at the following internet link:

<http://www.dot.il.gov/materials/precastconcretephotos.pdf>

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